DOCUMENT RESUME

ED 320 761 SE 051 449

AUTHOR	Howe, Robert W.; Disinger, John F.
TITLE	Environmental Education that Makes a Difference--Knowledge to Behavior Changes. ERIC/SMEAC Environmental Education Digest No. 4, 1988.
INSTITUTION	ERIC Clearinghouse for Science, Mathematics, and Environmental Education, Columbus, Ohio.
SPONS AGENCY	Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO	EDO-SE-90-12
PUB DATE	88
CONTRACT	RI88062006
NOTE	4p.
AVAILABLE FROM	ERIC/SMEAC, The Ohio State University, 1200 Chambers Road, Room 310, Columbus, OH 43212 ($1.00 single copy; ordered in a set of four for the year and content area $3.00).
PUB TYPE	Information Analyses - ERIC Information Analysis Products (071)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Attitudes; *Behavior Change; Concept Formation; *Curriculum; *Educational Improvement; Elementary School Science; *Elementary Secondary Education; *Environmental Education; Program Descriptions; Secondary School Science; *Teaching Methods
IDENTIFIERS	ERIC Digests

ABSTRACT

Goals and objectives of many state and local environmental education programs have included developing students with knowledge, skills, positive attitudes and motivation to take action, to prevent and to resolve environmental problems. This digest describes variables involved in developing responsible environmental behavior and some teaching approaches and materials that have been effective in achieving this goal. Implications for educators are discussed. A list of 13 selected references is included. (CW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED320761

ENVIRONMENTAL EDUCATION THAT MAKES A DIFFERENCE-
KNOWLEDGE TO BEHAVIOR CHANGES

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Robert W. Howe

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

by

Robert W. Howe
and
John F. Disinger

ERIC/SMEAC Environmental Education Digest No. 4, 1988

SE051449

BEST COPY AVAILABLE

ERIC Clearinghouse for Science, Mathematics, and Environmental Education

1200 Chambers Road, Third Floor
Columbus, Ohio 43212
(614) 292-6717

ERIC/SMEAC Environmental Education Digest EDO-SE-90-12 No. 4, 1988

ENVIRONMENTAL EDUCATION THAT MAKES A DIFFERENCE-KNOWLEDGE TO BEHAVIOR CHANGES

Goals and objectives of many state and local environmental education programs have included developing students with knowledge, skills, positive attitudes and motivation to take action, to prevent and to resolve environmental problems. This digest describes variables involved in developing responsible environmental behavior and some teaching approaches and materials that have been effective in achieving this goal.

What do we know?

Individuals who exhibit responsible environmental behavior on a broad range of problems have:

(1) Knowledge of relevant environmental concepts;
(2)Knowledge of environmental problems and issues;
(3) Concern for the quality of the environment;
(4) Knowledge of action strategies that may be used for resolving an issue;
(5) Belief that their action can make a difference.
(6) Commitment to take action; and
(7) Experience in action based activities.

Data indicate that a good knowledge of environmental concepts is not sufficient; knowledge of environmental issues, issue skill analysis, and attitudes and values related to taking action are also necessary for the individual to take action and to act responsibly.

Some states, such as Wisconsin (Engelson, 1985), have developed state curriculum guides that recognize the need to provide for these variables in school programs, beginning early in the school program and continuing the emphasis throughout the school program. The Wisconsin program supports a hierarchical approach and that (1) concepts, attitudes and skills develop over time, (2) effective programs involve both cognitive and affective emphases, (3) effective programs require issue analysis, and (4) experiences should be provided that help the individual develop the feeling that their efforts and actions can make a difference with real issues and problems.

Environmental curriculum developers have been working to develop and test materials to help students to exhibit more responsible environmental behavior. Three sets of materials that have been found to have a significant impact on student learning and behavior are summarized in this digest. Other materials are available through the National Diffusion Network and listed in the ERIC database.

What are some environmental education approaches that make a difference in developing responsible environmental behavior?

Conservation for Children

Conservation for Children (NDN, 1988) is a program for use in grades 1-6 designed to increase (1) conservation awareness, (2) understanding of basic scientific environmental, and conservation concepts, and (3) conservation action. The program includes a variety of basic skill activities in the areas of language arts, mathematics, social studies and science with conservation concepts and conservation action.

The infusion approach used in the program provides a conservation emphasis throughout the curriculum. The program also provides a continuing emphasis on conservation concepts and behaviors over time by providing materials for six years.

Materials can be used to replace or to supplement current materials so relatively little additional class time is needed. Six grade-level curriculum guides and one all-level guide (activities, resources) are available. Data indicate most pupils who use the materials on a regular basis learn over 80 percent of the concepts and implement conservation practices at home.

Investigating and Evaluating Environmental Issues and Actions: Skill Development Modules

Hungerford and his associates have analyzed research on variables related to the development and demonstration of environmentally responsible behavior and have designed and tested a set of instructional materials based on this research (Hungerford, 1985). The materials stress a hierarchial-approach involving four levels of activities (Hungerford p 28-29 in Disinger, 1987).

1.Ecological Concepts: This goal level attempts to provide the learner with the ecological knowledge that will permit him/her to make ecologically sound decisions with respect to environmental issues. This knowledge would include (but not be limited to) such concepts as individuals and populations, interaction, limiting factors, biogeochemical cycling, abiotic influences, homeostasis, succession, etc.

2. Conceptual Awareness: This goal level attempts to develop a conceptual awareness (i.e., knowledge) of how individual and collective behaviors influence the relationship between quality of life and the quality of the environment, as well as how human behaviors result in issues which must be resolved through investigation, evaluation, decision-making, and citizenship action.

3. Issue Investigation and Evaluation: This goal level attempts to develop the knowledge and skills needed to permit learners to investigate environmental issues and evaluate alternative solutions for remediating these issues. It also provides opportunities for students to actually investigate and evaluate issues.

4. Environmental Action Skills: Training and Application: This goal level attempts to develop those skills needed for learners to take positive environmental action for the purpose of resolving or helping resolve environmentally-related issues.It also involves the development of action plans by the

students and provides them with the opportunity to implement those plans if they desire.

Research data indicates that behavior change usually will not occur if students are exposed only to Goals 1 and 2. The data also indicates that behavior will change if students are thoroughly exposed to Goals 3 and 4 in addition to 1 and 2. The quality of the students environmental actions also tends to improve when they have used issue analysis and investigation.

The materials Hungerford and his associates have developed include six modules: (1) Environmental Problem Solving; (2) Issue Investigation (Basics); (3) How to Gather Information; (4) Interpreting Data; (5) Investigation of Issues; and (6) Environmental Action Strategies. (Hungerford, 1988).

Studies report that effective use of the modules has usually required about 18 weeks of instruction and activities, but alternative approaches have been suggested in the literature. The modules have been tested primarily at the middle school and junior high school level, but could probably be adapted to grade levels as low as four and certainly could be used with older students in secondary schools and postsecondary institutions.

Decisions for Today and Tomorrow: Issues in Science-Technology-Society

These materials by Iozzi and Others (1987) were developed to supplement secondary school programs in the areas of science and social studies. The materials stress developing a knowledge base, problem solving, critical thinking, and thoughtful action.

The materials include a student guide with 12 chapters related to science-technology-society and the environment. There are two teacher guides that provide background material for the teachers, lesson plans, handouts, and worksheets. The guides provide suggestions on effective teaching approaches and activities to use.

Summary

Research has identified several variables that are important in developing students who exhibit responsible environmental behavior. Programs and materials that include experiences with issue analysis, issue investigation, and working on real environmental issues and problems have been more successful than those that have not included these experiences. Programs that have included an emphasis on environmental knowledge and problems over several months to several years have also been more successful than brief activities. School staff and non- formal program developers concerned with effective environmental education programs should consider including such experiences in their programs.

SELECTED REFERENCES

Disinger, John F. *Trends and Issues in Environmental Education: EE in School Curricula*. ERIC/SMEAC, Columbus, OH, 1987. ED 292 608.

Engleson, David C. *A Guide To Curriculum Planning in Environmental Education*. Madison, WI: Wisconsin Department of Public Instruction, 1985. ED 264 134.

Hines, J. *An Analysis and Synthesis of Research on Responsible Environmental Behaviors*, Ph. D. Dissertation, Southern Illinois University, Carbondale, IL 1984.

Hines, J. M., H. R. Hungerford, and A. N. Tomera. Analysis and Syntheses of Research on Responsible Environmental Behavior: A Meta-Analysis. *Journal of Environmental Education*, Vol 18 N2, p 1-8, 1986-87.

Hungerford, Harold R. and others. *Investigating and Evaluating Environmental Issues and Actions: Skill Development Modules. A Curriculum Development Project Designed to Teach Students How to Investigate and Evaluate Sci-Related Social Issues. Modules I-VI*. 1985. ED 257 664.

Hungerford, H. R., R. A. Litherland, R. B. Peyton, J. M. Ramsey, A. N . Tomera, and T. L. Volk. *Investigating and Evaluating Environmental Issues and Actions Skill Development Modules*. Stipes,Champaign, IL. 1988.

Iozzi, Louis A., Ed; Clint L. Shepard, Ed. *Building Multicultural Webs through Environmental Education. Selected Papers from the Annual Conference of the North American Association for Environmental Education (17th, Orlando, Florida, October 14-19, 1988)*. North American Association for Environmental Education, Troy, Ohio. ED 308 089.

Iozzi, Louis A. *Decisions for Today and Tomorrow. Issues in Science-Technology-Society. Teachers Guide*. Sopris West, Longmont, CO, 1987. ED 289 737.

Iozzi, Louis A., and Peter J. Bastardo. *Decisions for Today and Tomorrow: Student Guide. Issues in Science-Technology-Society. A Multidisciplinary Approach to Problem-Solving and Critical Thinking*. Sopris West, Longmont, CO, 1987.

Mann, Lori D.; and others. *Excellence in Environmental Education: Gaining Momentum for the Challenge Ahead. Selected Papers from the Annual Conference of The North American Association for Environmental Education* (16th, Quebec City, Quebec, Canada, October 16-21, 1987). North American Association for Environmental Education, Troy, Ohio. ED 301 417.

National Diffusion Network. *Education Programs That Work*. Washington, DC, US Department of Education. 1988.

Sia, A. H., Harold R. Hungerford, and A. Tomera. Selected Predictions of Responsible Environmental Behavior; An Analysis *Journal of Environmental Education*. Vol 6 N2, p 31-40, 1986.

Stone, Jody M., Ed. *Environmental Education: Transition to an Information Age. Proceedings of the Annual Conference of the North American Association for Environmental Education (15th, Eugene, Oregon, September 11-16, 1986)*. North American Association for Environmental Education, Troy, OH. ED 287 691.

Prepared by

Robert W. Howe,
Director

and

John F. Disinger,
Associate Director for Environmental Education

This digest was funded by the Office of Educational Research and Improvement, U.S. Department of Education under contract no. RI-88062006. Opinions expressed in this digest do not necessarily reflect the positions or policies of OERI or the Department of Education.